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NOVEMBER, 1918.

ENTOMOLOGICAL NEWS

Vol. XXIX. No. 9

Benjamin Dann Walsh
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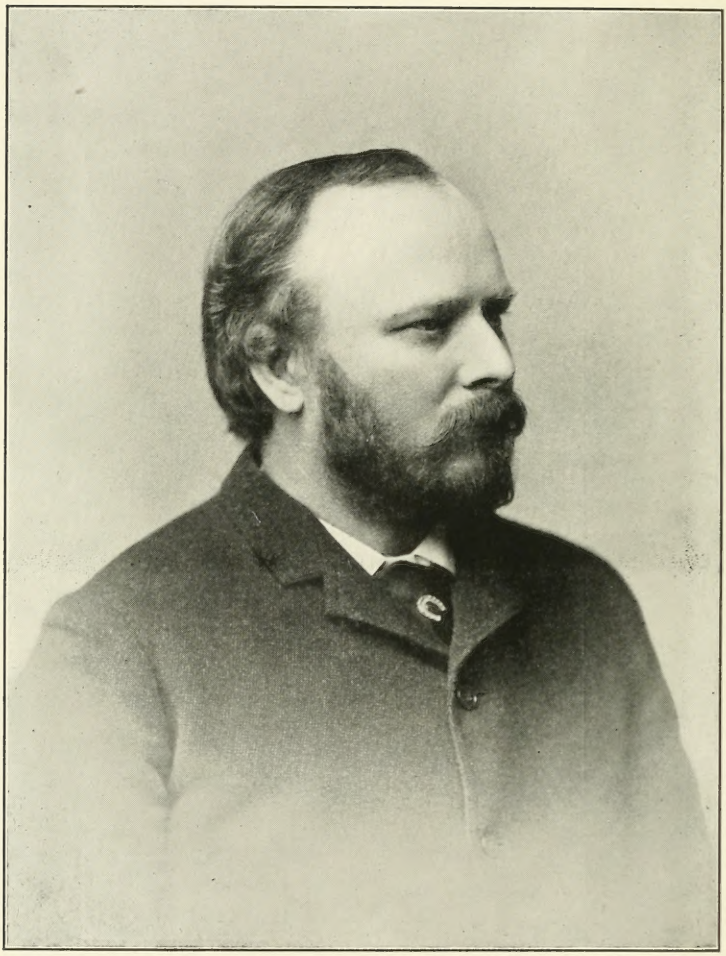

SAMUEL WENDELL WILLISTON.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIX. NOVEMBER, 1918. No. 9.

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Professor Samuel Wendell Williston.

We present herewith, as a frontispiece (Plate XVIII) to the present November number of the NEWS, a portrait of the late eminent dipterologist, Professor Samuel Wendell Williston. The photograph from which it was taken is an old one, probably dating from the eighteen-eighties, which were the years when Dr. Williston was most active in his entomological work. In later years his appearance was very different, as those who saw him at recent meetings of the Entomological Society of America will recall. We understand that a more familiar portrait, of a date of four or five years ago, will probably appear in another journal, but that which we offer here more nearly corresponds to that of the dipterologist than to that of the paleontologist. Elsewhere in this issue, Dr. Williston's life and career is very appreciatively and sympathetically sketched by his friend and pupil, Professor Aldrich.

Samuel Wendell Williston.

By J. M. Aldrich, West Lafayette, Indiana.

Samuel Wendell Williston, the eminent palaeontologist and dipterist, died in Chicago on August 30, 1918. At the time of his death and for some years previous he was Professor of Palaeontology and Director of the Walker Museum in the University of Chicago.

He was born in Boston on July 10, 1852, and was therefore a little past 66 years old. His father was a blacksmith, uneducated but of native ability, who removed with his family to Manhattan, Kansas, in 1857. Here young Williston's boyhood was spent, and in due time he entered the Agricultural College in his home town, graduating from it in 1872. But his college course was interrupted, for he ran away from home at 18 and went to work as a railroad laborer, from which humble position he rose before he was 20 to be a transit man at a handsome salary for that time. However, he suffered greatly from malaria, and had to resign and go back home; after recuperating he finished his college course. Railroad engineering went flat in the panic of 1873, and he began to study medicine, "reading" in the office of a local doctor. In the summers of 1874 and 1875 he assisted Professor B. F. Mudge on fossil-collecting expeditions in Western Kansas, the work being done for Professor Marsh of Yale University. He spent the winter of 1875-6 in the medical school of the University of Iowa, and was invited to come to Yale to see Marsh in the spring; this resulted in a contract to work for Marsh for three years at $40 a month, and in all to almost continuous employment with him for nine years, until 1885. He managed to finish his medical course and get his M.D. at Yale in 1880. But by this time his scientific bent was strongly developed, and it soon appeared that his work lay in following it rather than in the practice of medicine. He specialized in palaeontology, and received his Ph.D. under Marsh in 1885. His genius for anatomy led to an appointment as demonstrator in Yale Medical the following year, and after a short appren-

ticeship to the full professorship in human anatomy in 1887,—a striking recognition of his ability.

After three years in this position, he accepted a call to the University of Kansas in 1890 as Professor of Historical Geology and Palaeontology. Twelve years of his prime were spent in this institution, years crowded with productive labor. He helped organize the medical department of the University, and took on the deanship of it along with his other work; this almost broke his vigorous health, and he had to slacken his pace,—perhaps never again quite regained it.

The consciousness that he was working beyond his strength had something to do with his going to the University of Chicago in 1902 as Professor of Palaeontology. Here he was able to concentrate on a single specialty, officially at least, as he left medicine behind and thought he had left entomology also. In this place he spent the last fourteen years of his life, beginning under some unexpected handicaps and gradually working up to full recognition and honor.

In the outline just given, entomology is hardly hinted at, for the reason that Williston never held an official entomological position. But he found time to do much valuable work as a pioneer in dipterology. His employer would not allow him to publish in palaeontology, and he sought a field outside where he could be free to work and publish; this he found in the Diptera. His interest in the flies began to be serious about 1878. At this time Osten Sacken had returned to Europe, and there was not a single American student of the order but Edward Burgess, the Boston yacht designer, who published only one small paper. So Williston was virtually alone on the continent. In the absence of guidance, he plowed his way by main strength (as he often narrated to the writer) through descriptions of species until here and there he made an identification, which served as an anchor point for a new offensive. He had few definitions of genera, so had to work backward from the species. After a year or two of this tedious and time-wasting effort he came upon Schiner's Fauna Austriaca, in which the Austrian families,

genera and species of Diptera as known up to 1862-4 are analytically arranged and succinctly described. To his immense relief and satisfaction, he now found that all his American flies could be traced to their families, and most of them to their genera, in this fine work. He was so impressed by the saving of time accomplished that his own publications coming later show the effect of this early experience on every page; everywhere he has the beginner in mind and is clearing the way for him.

In a few years he began publishing tentative papers analyzing the American families and genera of the flies. These he extended and enlarged in a pamphlet in 1888, and again in a bound volume in 1896; and in 1908 published a third edition still more complete, with 1000 figures, his well-known Manual of Diptera. This third edition is his main contribution to entomology. It is a handbook unapproached by anything else dealing with a large order of insects. From necessity he published it at his own expense; it was eight years before the receipts from sales covered the cost of printing, but happily he lived to see this consummation.

His other papers of his early period, 1881-89, dealt with Asilidae, Conopidae, Tabanidae, and smaller groups, and especially with Syrphidae, in which his fine monograph of 1886 is still in universal use, and by the taxonomic genius of its author has created in the United States an ineradicable belief that the family is an easy one, well adapted for the beginner to publish in; a mistaken belief, but highly complimentary to the monographer.

From 1890 his more important papers were concerned with tropical Diptera (Mexico, St. Vincent, Brazil), and with bibliography. As his official duties grew more exacting, he gradually abandoned entomology, but he had as many farewell appearances as an opera singer, for he could not resist the temptation to come back again and again. Even as late as the spring of 1917, when he was visiting the writer and reveling once more in a collection of Diptera, his old enthusiasm came back so strongly that he planned describing some new genera,

and did in fact publish one (Annals Ent. Soc. Amer., x, 23). But after 1896 he did little work on the order except in preparing the third edition of his Manual, which cost him two years of arduous work, as he drew 800 figures with his own hand. His deep interest in genera and his very wide acquaintance with them, together with his universally recognized taxonomic ability, made him in the period 1890-1900 the peer of Osten Sacken, Brauer and Mik as a world-authority in Diptera.

The types of Williston's new species are much scattered. His Syrphidae were acquired by the National Museum; the rest of his earlier collections by the University of Kansas; his *Biologia* material and that from St. Vincent went to London, and I understand were finally deposited in the British Museum; the American Museum of Natural History obtained his later collections, including some duplicates of type series from St. Vincent and perhaps Mexico. Williston did not believe in designating a single type specimen, hence in some cases his types of the same species are in two museums. He had no collection of Diptera in his last years, although he still retained his fine library in the order.

Although he never gave any formal entomological courses, he gave informal and even more valuable assistance both in Kansas and Chicago to several entomologists who were specializing on Diptera; among them W. A. Snow, Hugo Kahl, C. F. Adams, A. L. Melander and myself. We all admired him, and our admiration grew into deep love and veneration with the passing years. He had students outside of entomology like E. C. Case and C. E. McClung, who achieved high scientific standing. His lecture courses in palaeontology were full of broad generalizations about evolution, and in the highest degree stimulating and profitable to students with biological training, as I am informed by Melander, who took them. He did not have large classes at any time, and his lectures were mostly informal in style, drawn from a rich experience and given in intimate association with the student, the kind that would make a deep impression. But his life work was mainly directed to the larger circle outside his institution.

While in New Haven he received a visit from C. V. Riley, who urged him to come to Washington as first assistant in the Division (afterward Bureau) of Entomology. But Williston entertained a shrewd doubt as to whether he could be happy in a position subordinate to Riley, and declined the offer, although its acceptance would have meant a permanent position at an increased salary. This incident was narrated to me several times by Williston; it occurred about 1885.

In the last few years Williston published two volumes on fossil reptiles, his greatest specialty, and last winter was working on a handbook of reptilia, which was probably near completion when he was compelled to abandon it. If this volume can be printed, it will close up his work on the reptiles about as well as his Manual of Diptera did for the flies. My last mental picture of the man represents him on a day last winter, sitting at a table before a window in his study at home, in one hand a long-snouted reptilian skull, in the other a drawing pen with which he was rapidly making a sketch of it.

He attended the Pittsburgh meeting of the Entomological Society of America last winter and gave reminiscences of his early work on Diptera to an interested audience.

In physique he was large and vigorous, and mentally he was greatly endowed. I think I shall offend no living American dipterist when I say that he towered above us all. The truth of the assertion will be more clearly evident if we consider that his work on Diptera was never more than a side line, an absolute gift to science, accomplished in odd times while he was attaining distinction in anatomy and world-wide reputation in palaeontology, his main specialties.

Considering the positiveness of his opinions and his frankness in expressing them, his life was singularly free from scientific controversies, and especially from those leading down into personalities. In many long conversations with him, I do not recall that I ever heard him express a personal dislike for a scientific colleague, except in one case where he felt that advancement in a teaching position had been obtained by servility, and another where he felt that his own matured opinion had been treated rather contemptuously.

His last years were full of honors. He was a delegate to the International Zoological Congress at Monaco; Yale University gave him an honorary D.Sc.; he was chosen to the limited membership of the National Academy of Sciences, and the Entomological Society of America made him an Honorary Fellow, one of seven out of its membership of 600.

He was married in 1880 to Annie I. Hathaway, of New Haven, who survives him together with three daughters and a son.

I first knew him by correspondence in 1890, when on learning that I was beginning to work on Diptera he sent me separates of his papers. In January, 1893, I went to the University of Kansas to study, drawn entirely by his presence there. He received me with open arms, and helped me in every way possible until I left in July to take up my work in Idaho. Then I saw him only a time or two in twenty years, and had few and short letters from him, for he was a notably poor correspondent. After coming to Indiana in 1913 I was so near that we were frequently together. My sketch would be entirely inadequate without some acknowledgment of my personal obligation. In Kansas he lent me money; he wanted me to live in his house; he could not do enough to further my scientific aspirations. More than any other of my teachers, he became my ideal of a scientific man; and if in later years my ideal took on larger proportions, so he too seemed to expand in his mature powers; and at the close of his life I still feel that a splendid and inspiring example of scientific work and achievement is contained in his career.

Notes on Cynipidae, with Description of a New Species (Hym.).

By William Beutenmuller, New York City.

Biorhiza nigra Fitch.

Biorhiza nigra Fitch, 5th Rep. Nox. Ins. N. Y. (Trans. N. Y. Agric. Soc., 1858 (1859), 782).

Acraspis politus Bassett, Trans. Am. Ent. Soc., vol. XVII, 1890, p. 85.

Fitch's type of *Biorhiza nigra* is in the United States National Museum and not lost as stated by me in my paper on the species of *Biorhiza, Philonix* and Allied Genera, and their Galls (Bull. Am. Mus. Nat. Hist., Vol. XXVI, 1909, p. 246). I examined the type a few years ago and my notes say that it is the same as *Acraspis politus* Bassett.

Philonix fulvicollis Fitch.

Philonix fulvicollis Fitch, 5th Rep. Nox. Ins. N. Y. (Trans. N. Y. Agricul. Soc., 1858 (1859), p. 783).

Cynips q. erinacei Walsh, Proc. Ent. Soc. Phila., vol. II, 1864, p. 483 (gall only).

Philonix erinacei Beutenmuller, Bull. Am. Mus. Nat. Hist., vol. XXVI, 1909, p. 247.

The type of *Philonix fulvicollis* Fitch, is in the United States National Museum and *Philonix erinacei* is the same as *P. fulvicollis.*

Philonix nigricollis Fitch.

Philonix nigricollis Fitch, 5th Rep. Nox. Ins. N. Y. (Trans. N. Y. Agricul. Soc., 1858 (1859), p. 873).

The type of *P. nigricollis* is in the U. S. National Museum. It is a small, slender species, measuring 2 mm. in length. It is dark reddish brown with the collar darker and the legs yellowish brown.

Philonix lanaeglobuli (Ashmead).

Acraspis lanaeglobuli Ashmead. Trans. Am. Ent. Soc., vol. XIV, 1887, pp. 128, 139.

I examined the type of *lanaeglobuli* in the U. S. National Museum and also have before me an example given to me many years ago by Ashmead. I strongly suspect that *Acraspis gillettei* Bassett will prove to be the same as *lanaeglobuli.* The galls of both are also exactly similar.

Callirhytis agrifoliae (Bassett).

Cynips q. agrifoliae Bassett. Can. Ent., vol. XIII, 1881, p. 53.

Callirhytis clairmontis Kieffer. Invert. Pacifica, vol. I, 1904, p. 43.

Mr. C. F. Baker kindly sent me specimens of *Callirhytis clairmontis,* galls and flies and I find the same to be identical with *Callirhytis agrifoliae.* Mr. Baker's specimens are from

the same material sent to Prof. Kieffer for description of *clairmontis*.

Odontocynips nebulosa Kieffer.

Odontocynips nebulosa Kieffer, Boll. Lab. Agricol. Portici, vol. IV, 1910, p. 112.

This species was heretofore known only by the types from Georgia and Texas in the Berlin Zoological Museum and was unknown to American collectors until Prof. E. P. Felt sent me specimens of the flies and galls taken at Woodstock, Georgia, in February, 1917, on the roots of oak. Mr. Lewis H. Weld was fortunate enough to collect the galls on the roots of Post oak (*Quercus minor*) at Palestine, Texas, Oct. 16, 1917, and sent me specimens from which I obtained a fine series of females. These were cut from the galls in December while others emerged January 19th to February 26th, 1918 (indoors), and others are still in the galls. The gall is composed of large, rounded, hard, woody nodulus, closely grown together, so as to form a large mass, while others are single or in clusters. Each nodule contains a single large larval chamber. The fly is a beautiful creature. It is deep brownish black or almost black and covered with fine, silky, whitish hairs. The wings are marked with large blackish patches. The genus is allied to *Cynips* and may be characterized by having a large tooth on the under side of the hind femora.

Andricus impositus sp. nov.

♀.—Head dark rufous, evenly punctate and clothed with short white hairs. Antennae 13-jointed, pitchy brown-black.

Thorax black, subopaque, evenly and finely punctate. Parapsidal grooves very fine, not continuous, extending forward to about the ends of the anterior parallel lines, and most distinct at the scutellum. Median groove very fine and about as long as the parapsidal grooves. Lateral grooves scarcely defined. Anterior parallel lines shining and extending to the middle of the thorax. Pleurae punctate, hairy, with a polished, smooth area. Scutellum black, evenly rugoso-punctate, basal fovea large and deep.

Abdomen black, slightly rufous at the extreme base and tip, smooth, polished and with a rounded patch of whitish hairs on each side at the base.

Fore tibiae brown, femora darker, middle and hind legs pitchy brown with the knees paler.

Wings hyaline, veins delicate brown. Radial area closed. Cubitus exceedingly faint and not extending to the first cross-vein. Areolet large.

Length, 2.75 to 3.25 mm.

Gall.—On the under sides of the leaves of post oak (*Quercus minor*) in clusters from about 4-40 individuals closely packed together, on the mid-rib and lateral veins, September to November. Monothalamous. Green, sometimes tinged with red. Elongate, rounded at the sides, narrow at the point of attachment and concave at the apex with a small central nipple. Outside it is rather densely covered with small pustules. When young, the gall is almost solid, but as it grows older the larval chamber gradually occupies the entire interior. After it drops to the ground, late in the fall, the gall gradually changes its shape to almost globular (berry-like) with the concave apex flattened and the surrounding rim less prominent. The crystal-like pustules change, the gall becoming evenly rugose. The point of attachment becomes long, narrow and sharply pointed. The entire inside becomes hollow with the outer wall thin and brittle.

Length, 2.50 to 5 mm.; width, 2 to 4 mm.; length of clusters, 5 to 35 mm.

Habitat: Westchester, New York City.

Type: female in the writer's collection.

My observations on the galls were made from at least 500 clusters. At first I considered it to be that of *Zopheroteras vaccinii* Ashm., which it resembles when immature. But the flies are different, the female of *vaccinii* being apterous. The gall of *A. impositus* when mature resembles somewhat those of *Cynips dimorphus* and *C. vacciniiformis*. My galls were collected during September and until November 1st, 1915, but they evidently also occur earlier in the season, because some of the flies emerged in June and July and others in September, 1916. But the majority remained over until 1917, the flies emerging indoors in January and February. My specimens were collected on a small rocky elevation in a swamp, close to the Bronx River, near Westchester, New York City. This locality is gradually being filled in for streets and other improvement and soon will become extinct. I have also taken the gall at Lakehurst, New Jersey, and it probably will be found in other places where *Quercus minor* grows.

An Annotated List of Gainesville, Florida, Coleoptera.

By H. L. Dozier, University of Florida.

(Continued from page 298)

BUPRESTIDAE.

Chalcophora virginiensis Drury. A common species. The larvae bore in pine.

Chalcophora georgiana Lec. Not as abundant as the above species. May.

Dicerca obscura Fab. An adult taken on pine log, Jan. 3 (J. R. W.).

Dicerca punctulata Sch. A specimen in sandy road. (W. E. Pennington) Jan.

Buprestis lineata Fab. Not an uncommon species.

Buprestis connexa Horn. An undated specimen. (J. R. W.).

Buprestis decora Fab. Two specimens on pavement near pine trees—one contained a large number of well-developed eggs—March 29.

Melanophila notata L. & P. One in flight, Mar. 31.

Anthaxia cyanella Gory. Always taken on foliage of oak. First of season taken March 27. Very abundant on young red oak bushes in open fields, April 15.
13. (J. R. W.).

Chrysobothris femorata Fab. var. At dogwood blossom, April

Chrysobothris chrysoela Illig. One in flight, Nov. 1. An uncommon species.

Chrysobothris sp. An undated ♀.

Actenodes auronotata Lap. This is a Cuban species found occasionally in Florida. Several specimens in flight, June 27-28.

Acmaeodera ornata Fab. An uncommon species, May 1.

Acmaeodera tubulus Fab. Taken in dew-berry blossom, March 2. Abundant at wild plum blossoms, Mar. 8. On bull thistle, April 11.

Agrilus subcinctus Gory. Numbers taken *in copula* on ash leaves in hammock, April 4. Mar. 24-Apr. 4.

Taphrocerus agriloides Cr. Numbers taken by sweeping nut grass and low herbage at hammock edge, April 1-3.

Brachys cuprascens Blatch. Extremely abundant eating oak foliage from March 24-April 16.

LAMPYRIDAE.

Calopteron reticulatum Fab. This large handsome species is found rather commonly on the foliage of various shrubs and trees, Mar. 5-June 25.

Celetes basalis Lec. On basswood leaf, April 2.

Photuris pennsylvanica DeG. Taken on pine at night and on corn plants, June 9.

Chauliognathus marginatus Fab. Our most common species here and abundant everywhere, especially at the blossoms of chinquepin and flowers. Taken nearly the whole year round.

Polemius limbatus Lec. Taken on needles of long-leaf pine, Dec. 4.

MALACHIDAE.

Melyris cribrata Lec. Abundant in blossoms of *Crategus* and dogwood, Mar. 3-11.

Melyris basalis Lec. Taken with the above species but less abundantly.

CLERIDAE.

Enoclerus thoracicus Oliv. Beaten from oak foliage, April 18.

Clerus lunatus Spin. One taken at chinquepin bloom, May 14.

Priocera castanea Newm. One taken at hammock edge, March (C. P. Bishop).

SCARABAEIDAE.

Canthon depressipennis Lec. Very common around dung in roads from April to Sept.

Canthon laevis Drury. Our most common dung beetle and is met with along roads, rolling their balls of dung, April-Sept.

Canthon nigricornis Say. Not as abundant as the above species, May 3.

Choeridium lecontei Harold. Taken occasionally at lights, May 27.

Copris carolina Linn. Most abundant during June.

Copris minutus Drury. A common species abundant nearly the year round. Very abundant at lights Feb. 5.

Copris anaglypticus Say. A specimen taken in ft. long tunnel beneath dung, March 12, evidently lying dormant (J. R. W.).

Phanaeus igneus MacL. A rather common species the year round, flying around dung in roads. While in flight, their buzzing greatly resembles that of the bumble-bee. Jan. 5-March 26.

Phanaeus carnifex Linn. Closely resembles the above species, but is not nearly so abundant. The males are rarely seen.

Onthophagus hecate Panz. Found frequently in dung.

Bolbocerosoma farctum var. **tumefactum** Beauv. A specimen taken from beneath bark of fallen pine Aug. 3. A specimen flying over grass of wet prairie, July 30 (J. R. W.).

Trox suberosus Fab. Taken at dead rat, June 28.

Diplotaxis languida Lec. Taken at night eating oak foliage, May 2. Mar. 12-May 2.

Diplotaxis bidentata Lec. Numbers taken at night feeding on chinquepin foliage, April 24. Varies in color from brown to black.

Diplotaxis frontalis Lec. Taken with the above species, April 24. Several at lights, April 6.

Diplotaxis subcostata Blanch. Large numbers taken under arc-light, April 6.

Ataenius imbricatus Melsh. Very abundant at lights, June 7.

Ataenius alternatus Melsh. Also very abundant at lights, June 7.

Aphodius lividus Oliv. Very numerous for several nights, June 7.

Aphodius stercorosus Melsh. A single specimen at lights, June.

Bradycinetus ferrugineus Bequv. Rather scarce. Lights, June 3-Aug. 30.

Bolboceras lazarus Fab. Abundant at lights, July 21 and Sept. 3.

Serica vespertina Gyll. A specimen taken eating foliage of young hickory, March 10.

Lachnosterna prununculina Burm. Several at lights, June 6. A swarm of hundreds was eating the foliage of pine at night, June 8. I was attracted by the loud buzzing of them overhead.

Lachnosterna glaberrima Blanch. One at lights, June 6.

Lachnosterna sp. nov. near **nova.** Three specimens taken beneath arc-light, April 6.

Lachnosterna parvidens Lec. One at light, April 4.

Lachnosterna latifrons Lec. At light, June 1.

Lachnosterna micans Knoch. An uncommon species here, April 5.

Polyphylla gracilis Horn. An uncommon species, but taken on pine, April 28-May 20.

Polyphylla occidentalis Linn. This species is also a pine foliage feeder, April 25-May 31.

Anomala semilivida Lec. A specimen on beggarweed, Aug. 13.

Anomala marginata Fab. One taken beneath log at Hogtown Creek, May 23. This species feeds on the foliage of the grape and various trees.

Strigoderma pygmaea Fab. Found abundantly on various weeds, corn and cotton, April 20-Aug.

Pelidnota punctata Linn. Taken in small numbers at lights during May.

Cyclocephala villosa Burm. A few at lights, June 7.

Dyscinetus trachypygus Burm. Abundant the year round at lights.

Ligyrus gibbosus DeG. Abundant at lights during May.

Dynastes tityrus Linn. Found occasionally beneath old logs. Abundant beneath arc-lights in July.

Stephanucha (Euphoria) areata Fabr. A rather rare species here. Taken only along sandy roads, Jan. 16-Feb. 19.

Euphoria sepulchralis Fabr. An extremely abundant species, oc-

curring at the blooms of chinquepin and especially at bull thistle. Abundant from March 25-Aug. 16.

Euphoria inda Linn. Occurs at blossoms of various plants, but is an uncommon species here, Oct. 9.

Trichius delta Forst. First made their appearance, April 28, at chinquepin blooms. Taken at blooms of *Salvia,* cherokee rose, and other flowers. These beetles were more or less abundant through June. An adult was taken at golden rod bloom, Aug. 9.

Adults of this species, together with *T. piger,* were reared from larvae collected in oak stump. The grubs greatly resemble those of *Lachnosterna* but are smaller in size and are of a more creamish color.

Trichius viridulus Forst. A specimen taken in bloom of southern papaw along roadside. Occurs also at blooms of chinquepin. A rare beetle here as elsewhere, May 23.

Trichius piger Fabr. Occurs at flowers of various kinds, including New Jersey tea and the magnolia. Is not as abundant as *T. delta* and apparently has not as long a season as that species. May-June.

Trichius texanus. Three taken at chinquepin blooms, May 20 (C. Nieland).

CERAMBYCIDAE.

Orthosoma brunneum Forst. Taken occasionally at lights.

Criocephalus nubilus Lec. Taken at lights, March 10-April 20.

Chion cinctus Drury. Common at lights, Jan.-April 15.

Eburia quadrigeminata Say. Occasionally at lights.

Eburia stigma Oliv. A specimen at light, June 11.

Romaleum atomarium Drury. At light, June 15.

Elaphidion mucronatum Say. Light, June 8.

Elaphidion unicolor Rand. A specimen at light, June 8.

Heterachtes ebenus Newm. A specimen at light, Sept. 25.

Molorchus bimaculatus var. **semiustus** Newm. Rather common at blossoms of dogwood and *Crategus,* March 11-12.

Molorchus bimaculatus var. **corni** Hald. A single specimen of this variety taken at dogwood blossom, March 10.

Molorchus bimaculatus var. A specimen of a black variety of *bimaculatus* taken at *Crategus* blossom, March 12.

Rhopalophora longipes Say. One taken at dogwood blossom, March 11.

Callichroma splendidum Lec. A specimen of this uncommon beetle was taken in piny woods, flying from the bark of one pine tree to another, making a loud buzzing noise as it flew, April 21 (O. Manecke).

Xylotrechus colonus Fabr. Rather common at lights.

Xylotrechus sagittatus Germ. A specimen taken on recently cut pine stump, Sept. 24 (J. R. W.).

Neoclytus erythrocephalus Fabr. A pair collected in copula at Hogtown Creek, Feb. 20 (J. R. W.). Bred from Japanese persimmon.

Strangalia famelica Newm. var. One specimen (J. R. W.)

Strangalia strigosa Newm. Rather abundant at chinquepin blooms, May 7.

Typocerus velutinus Oliv. Taken at chinquepin bloom, May 10 (J. R. W.).

Typocerus zebratus Fabr. On pine foliage in March. On small thistle in open field, April 20.

Monohammus titillator Fabr. A very common species that breeds in pine, June 9-Oct. 20.

Dorcaschema alternatum Say. An undated specimen.

Leptostylus planidorsus Lec. A specimen at light, Sept. 28.

Leptostylus aculiferus Say. An abundant species.

Liopus alpha Say. Taken at lights, Oct. 11 (J. R. W.).

Liopus alpha var. **floridanus** Hamilton. A specimen at light, Aug. 21.

Liopus minuens Horn. Two undated specimens (J. R. W.).

Graphisurus fasciatus DeG. Several newly emerged adults and pupae were taken beneath bark of fallen oak, Feb. 7. A specimen at light, Sept. 25.

Acanthocinus obsoletus Oliv. In flight at night, April 15-Oct. 11.

Ecyrus dasycerus Say. A specimen collected on fig bush, April 4.

Oncideres cingulata Say. The work of this beetle is very noticeable on pecan twigs. Its work has also been observed on blue beech.

Hippopsis lemniscatus Fabr. Breeds in stems of ragweed (*Ambrosia*), Aug. 6.

Saperda vestita Say. An undated specimen (J. R. W.).

Ataxia crypta Say. Several undated specimens (J. R. W.).

Oberea bimaculatus Oliv. An undated specimen (J. R. W.).

Oberea ocellata var. **plagiata** Casey. Taken in hammock, May 23-July 5.

(To be continued.)

Dragonfly Larva Feeding on a Living Snake (Odon.).

On the property of F. H. Kennard, Newton, Massachusetts, in a tank with a basin making a sort of aquarium, a dragonfly larva, 1-1½ inches long, bit pieces out of a water snake about 12 inches long. The snake died or was killed because of the wounds shortly afterward.—C. W. Frost, Philadelphia, Pa.

A New Tyroglyphid for Western Montana (Acar.).*

By Ernest Carroll Faust, Ph.D., University of Illinois.

(Plate XIX.)

Among the parasites found by the writer on the Balsamroot plant, *Balsamorrhiza sagittata,* in Western Montana, was the interesting mite described in this paper. The creature was found in Missoula, in June, 1916, gnawing and sucking the juicy parts of the new leaves. Neither the rootstock nor the underground stem was infected, nor were any other plants in the vicinity attacked by this acarinid.

The mite belongs to the Family Tyroglyphidae and to the genus *Rhizoglyphus.* It is most nearly related to the species *R. hyacinthi* (Boisduval) and *R. rhizophagus* Banks, both of which have been reported for the same locality (Cooley 1914, Banks 1906). However, marked differences in several points of structure in this mite justify the creation of a new species.

Rhizoglyphus sagittatae nov. spec. (Pl. XIX).

Ovate oblong, creamy yellow in color, with a thin chitinous covering. ♀, 0.5 mm. long by 0.26 mm. wide; ♂, 0.47 mm. long by 0.24 mm. wide. The rostral platform stretches forward considerably anterior to the main cephalic portion of the body. On the dorsum of this structure is a single pair of prominent bristles. On each side just behind appendage II is a single projecting bristle. In the posterior region of the abdomen are three pairs of bristles, one ventral and two slightly dorsal. The cephalothorax is separated from the abdomen dorsally by a distinct sutural groove.

One of the distinguishing features of the species, both male and female, is the character of the appendage spines. They are flat plates, broadly elliptic at the distal end, and fit deeply into the appendage at the proximal end. The characteristic sickle-shaped grasping spine at the end of the tarsi in the female and at the end of tarsi I, II and IV in the male is also plate-like and broadly lunar.

Tarsi I and II of both sexes have an apical crest, consisting of one lunar grasping spine and five elliptic spines. There is a single short bristle arising from their midst. From the tibia of segments I and II arise a large tactile bristle on the outside and an elliptic spine on the inside. The genual bears a single inconspicuous bristle on its outer margin. Tarsi I and II are appressed, so that they are broader than long. Tarsi III and IV in the female and IV in the male are, on the

* Contributions from the Zoological Laboratory of the University of Illinois under the Direction of Henry B. Ward.

NEW TYROGLYPHID, RHIZOGLYPHUS SAGITTATAE.—FAUST.

other hand, longer than broad. They bear a stout lunar grasping spine, a single elliptic spine on the outer side and three slightly smaller spines on the inner side. There are no bristles on tarsi III and IV. The tactile bristle of segments III and IV is small and inconspicuous. The tibia bears no spine in appendages III and IV of the female or in appendage IV of the male. Genuals III and IV of the female bear a single small bristle pointed outward. The third appendage of the male is heteromorphic (Fig. 6). The tarsus is practically reduced to a very large median hastate spine and a pair of smaller auxiliary spines. The tibia of male appendage III bears a small tactile bristle and a short broad spine.

The palpus of the prehypopid nymph is slender and its tarsus is crowned with several small bristles (Fig. 8). This appendage changes in the adult mite, so that it is shortened and broadened, while the tarsus is bluntly triangular and heavily chitinized (Fig. 9). As in other Tyroglyphidae, the mandibles are chelate without any marked dentitions.

The gravid female has from one to four large eggs, measuring about 170 by 90 μ. The shell of the egg is moderately thick (Fig. 5). The contents of the egg consist of large, highly refractive granules, irregularly oval in contour. The vulva is situated far cephalad between appendages III and IV. Around it is a broad horse-shoe shaped chitinous band, distinctly crenate anterior to the vulva. On this band are two pairs of genital suckers. The anus in the female is anterior to the ventral bristles.

The male is characterized also by the genital suckers. In addition the copulatory suckers, entirely postanal, are conspicuous. They have a large central cavity (Fig. 7). Only heteromorphic males have been found.

Type specimens are in the collection of the writer, Nos. 18.1 and 18.2.

Immature Stages.—There is a distinct hypopus. The prehypopid stage is a delicate creamy yellow octopod, whereas the hypopus has a heavy brownish yellow chitinous covering. The hypopus measures 0.26 mm. long by 0.16 mm. wide. The cephalothorax and abdomen are approximately equal. They are separated ventrally by a transverse suture. Appendages I and II are considerably larger than III and IV. Tarsi I and II are acute, ending in a spine. The round sucking plate at the posterior part of the ventrum consists of two inner rows of three suckers each and two outer rows of one sucker each. In addition, there is a pair of suckers anterior to the plate.

The relation of *R. sagittatae* to *R. hyacinthi* and *R. rhizophagus* is shown in the following table:

	R. sagittatae.	*R. hyacinthi.*	*R. rhizophagus*
Legs	short stout	short, stout	short, stout
Tarsus I	broader than long	longer than broad	longer than broad
Tarsi I and II	with one stiff bristle; with five elliptic spine plates	with two bristles; with four acutely pointed short spines	with two bristles; with five acutely pointed short spines
Tarsus IV	two and one-half times as long as broad; four spined, no apical hairs	three times as long as broad; three spined, two apical hairs	three times as long as broad; three spined, two apical hairs
Male	heteromorphic, leg III thickened; terminal spine not sickle-shaped; one large and two elliptic flat spine plates	heteromorphic, leg III thickened; terminal spine sickle-shaped	homomorphic, leg III not thickened, terminal spine sickle-shaped
Bristles of female	six dorsal abdominal near tip, two ventral abdominal postanal	six dorsal abdominal near tip, four subequal ventral abdominal	eight dorsal abdominal near tip, four subequal ventral abdominal
Tarsus of hypopus	terminated by long claw	terminated by stout single claw	?
Suctorial plate of hypopus	two inner rows of three suckers, two outer rows of one sucker, one pair anterior to plate	two longitudinal rows of three suckers, median one largest, one outer row of one sucker, four corner sucers	?

The various species of the genus *Rhizoglyphus* are noted for their root- or bulb-eating propensity. The cosmopolitan species, *R. hyacinthi*, is a serious pest to a great number of cultivated bulbs (Michael 1903). It was at first thought that this mite was merely a saprophyte or at most a parasite of pathological tissues. But the recurrent finding of the creature in otherwise healthy bulbs has caused the acarologist to discard that view and to consider it as a primary parasite. *R. sagittatae* is not a parasite of the root or underground stem of *Balsamorrhiza sagittata*. It is, on the contrary, always above ground, securing its nourishment from the aerial portion of the plant at the season when the leaves are succulent and juicy. It was even found on young seedlings some twenty to forty days old, taken from the field. *R. sagittatae* is

not an internal borer, channeling subdermal passageways, as *R. hyacinthi* is. Moreover, this species has always been found as a parasite on an indigenous plant, common to the Western uplands, while other rhizoglyphids described from this continent have been found on cultivated roots and bulbs, usually imported stock. This fact argues favorably for the indigeneity of *R. sagittatae*.

Records of *Rhizoglyphus* species as human parasites are not wanting. Dalgetty (1901) has shown that a dermatitis of coolies in the Indian tea fields during the wet season is attributable to a mite which has been designated as *Rhizoglyphus parasiticus*. However, the presence of a sessile caroncle, the lack of a distinct suture between cephalothorax and abdomen, the absence of heteromorphic males, and the plumose structure of some of the spines, practically exclude this species from the genus *Rhizoglyphus*. Similar records in the United States (Pepper, Schnauss and Smith 1908) attribute cases of intestinal dysentery to a mite "either identical with or more probably a closely related species to *Rhizoglyphus parasiticus* Dalgetty." While the latter acarinid more nearly conforms to the genus *Rhizoglyphus*, the data are too meagre to assign it to a definite systematic position. On the whole, true parasitism of *Rhizoglyphus* in man is questionable and not at all a settled fact.

Summary.

1. A new Tyroglyphid, *Rhizoglyphus sagittatae*, is described from western Montana. It is closely related to *R. rhizophagus* and *R. hyacinthi*, but is distinguished by the elliptic plate-like appendage spines and the paucity of bristles on the appendages.

2. The mite is superficially parasitic on the aerial portions of an indigenous plant of the western range, *Balsamorrhiza sagittata*.

3. The study of this species tends to show a wide diversity of the genus *Rhizoglyphus*.

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Explanation of Plate XIX.

All the figures are of *Rhizoglyphus sagittatae.*

Fig. 1—Adult female, X 140.
Fig. 2—Hypopus, X 140.
Fig. 3—Appendage III of female, X 440.
Fig. 4—Appendage I of female, X 440.
Fig. 5—Egg, X 180.
Fig. 6—Appendage III of male, X 440.
Fig. 7—Posterior ventrum of male.
Fig. 8—Prehypopid palpus, X 140.
Fig. 9—Palpus, adult female, X 440.

Proterandry and Flight of Bees (Hym.).

By Charles Robertson, Carlinville, Illinois.

That bees are proterandrous, the males appearing before the females, seems to be well known.[1] But it does not seem to be so well known, if at all, that the females fly a considerable time after the males disappear. In the Bombidae and Halictidae, except *Protcraner,* the females live all winter and come out in the spring. They belong to the males which preceded them in the fall before. But these two families are excluded here on account of the difficulty in distinguishing the broods.

Of 229 other local bees 184 (80.3 per cent.) are known in both sexes. As far as observed, they begin and end their flight as follows:

[1]See Loew, "Blumenbesuch von Insekten an Freilandpflanzen," *I*: 68, note 2. 1884.

Males first	Begin Males and females together	Females first
69.0	12.5	18.5
Females last	**End Males and females together**	**Males last**
87.5	2.1	10.3

The females are first in only 18.5 per cent. of the cases and the males last in only 10.3 per cent.

The males were observed first in 127 cases and the females last in 161. This accords with the probabilities, for the males average 9.6 days before the females, while the females average 22 days later than the males.

In 112 cases, 60.8 per cent. of those in which both sexes are known, the males are first and the females last. Of these 109 are taken as about correct, and normal, and three are excluded here as incomplete. The following table gives the number of normal species in each group and the average number of days under each heading:

	Normal	Males precede	Females follow	Males	Females	Species
Prosopis	3	11.3	21.0	143.0	152.6	164.0
Colletes	7	6.5	15.5	63.7	72.7	79.2
Andrenidae	16	6.8	22.5	33.6	49.4	56.2
Other short-tongued bees	7	6.0	26.1	29.8	50.0	56.0
Osmiinae	10	10.6	28.0	44.3	61.7	72.3
Megachilinae	10	6.5	25.1	63.8	82.4	88.9
Coelioxys	4	12.2	20.2	65.5	73.5	85.7
Stelididae	3	18.0	21.3	53.6	57.0	75.0
Nomadidae	11	9.1	22.2	35.8	49.0	58.0
Epeolidae and Melectidae	11	10.0	17.5	47.4	55.0	65.0
Tetralonia	4	3.7	14.0	37.2	47.5	51.2
Other Euceridae	18	10.8	12.1	59.0	60.2	71.1
Other long-tongued bees	5	10.4	17.8	58.4	65.8	76.2
Total	109	8.9	20.1	50.8	62.0	71.1

The males fly a shorter time before the females appear than the females do after the males disappear, and consequently have a shorter flight. In 109 cases there are only 27

exceptions. But as regards the exceptions, the presumption is that the observations are incomplete. Accordingly the average flight given in the table is too short for the females and the species.

As a rule the early groups have a shorter flight than the late ones: the Andrenidae than the Panurgidae, the Osmiinae than the Megachilinae, Nomadidae than other Melectoidea, Tetralonia than other Euceridae. But *Prosopis* has a longer flight than *Colletes,* and the Dasygastrae, although earlier, have a longer flight than the other long-tongued bees.

In the case of 72 Pygidialia: 23 short-tongued species have an early maximum and average 56.1 days; 27 long-tongued hosts have a late maximum and average 68.0 days; while 22 long-tongued inquilines average 61.6 days. In the case in which the inquilines are known they have a shorter flight than their hosts.

As regards their beginning, the Andrenidae are quite peculiar, so that they essentially modify the general result. Compare:

	Males first	Begin Males and females together	Females first	Total
Andrenidae	42.5	30.0	27.5	40
Other bees	76.3	7.6	15.9	144

According to Schmiedeknecht (Loew *l. c.*) *Andrena clarkella* is proterogynous. According to my observations the local species fall into the following three sets:

Proterandrous: Andrena erythronii, salicacea, sayi, erythrogastra, pruni, dunningii, geranii, Ptilandrena g. maculati, Opandrena cressonii, Trachandrena forbesii, rugosa, crataegi, Pterandrena krigiana, rudbeckiae, pulchella, helianthi, asteris.

Synchronous: Andrena salicis, carlini, illinoensis, nubecula, salictaria, platyparia, Ptilandrena polemonii, Parandrena andrenoides, Opandrena personata, ziziae, Trachandrena claytoniae, Pterandrena solidaginis.

Proterogynous: Andrena mandibularis, nasonii, Ptilandrena erigeniae, Iomelissa violae, Opandrena bipunctata, serotina, Trachandrena mariae, nuda, hippotes, spiraeana, aliciae.

A New Genus and Two New Species of Tettigids (Orthoptera), with a Note on Nomotettix borealis Walker.

By J. L. Hancock, Chicago, Illinois.

(Plate XX.)

Two new tettigids from the southern United States herewith described, are noteworthy as representing a new genus closely allied to *Neotettix* Hancock. Rehn and Hebard recently recorded[1] under the genus *Neotettix* another species called *proavus,* from Georgia and North Carolina, which properly belongs to this new genus; so that three species, one of which might possibly be a race, are known within our borders. Of these three species, *nullisinus,* from Brownsville, Texas, is selected because of its clearly defined characters, as the type of the genus, to which I have given the name *Cavotettix.* All three members of the genus, namely: *Cavotettix nullisinus* sp. nov., *Cavotettix proavus* Rehn and Hebard, and *Cavotettix apterus* sp. nov., are easily separated from members of the genus *Neotettix.*

CAVOTETTIX genus nov.

Somewhat resembling in general aspect the genus *Neotettix* Hancock in the small size, the abbreviated pronotum, and the wide and nonproduced vertex as viewed from above, but differing as follows: the body apterous or subapterous; the median carina of the vertex more compressed; the somewhat wider scutellate frontal costa; in the tectate dorsum, with the median carina of the pronotum compressed-cristate. This genus is also differentiated by the broad scapular area at the sides of the pronotum; the lateral lobes of the pronotum bearing but one deep and angular excavate sinus, the superior tegminal sinus being vestigial or entirely obliterated; the tegmina either absent, or minute, vestigial; the wings absent or rudimentary, normally covered from view; the first joint of the hind tarsi nearly twice the length of the second and third combined.

[1] Proc. Acad. Nat. Sciences, pp. 139, 140, 1916, plate XII, Figs. 1-2.

This genus borders on the Cladonotinae, as evidenced by the widely forked scutellate frontal costa; however, the other general characters present, perhaps, a greater leaning toward the Tettiginae.

Type: *Cavotettix nullisinus* sp. nov.

Cavotettix nullisinus sp. nov. (Pl. XX, figs. 1, 1a).

♀.—Description drawn from type. Stature moderately small, above coarsely granulate-rugose, sparingly scattered with tubercles on the disc of the pronotum.

Antennae short, eyes moderately small but prominent, head having the cheeks depressed below the antennae. Vertex nearly twice the width of one of the eyes, the median carina prominent, compressed and elevated above the eyes, arcuate and forming with the frontal costa a subrounded advanced profile, yet flattened in front and subsinuate between the eyes and below at the median ocellus; frontal carinulae of vertex interrupted and open in front on each side next to the median carina, but outwardly curved and little compressed at the sides next to the eyes; surface of vertex between the eyes fossulate forward and mammilate backward on each side, the occiput partly covered behind; frontal costa widely forked, sulcate and divergent above between the eyes, widely separated and scutellate between the antennae, between the latter, and below, the rami subparallel.

Pronotum with the dorsum strongly tectiform, coarsely granulate-rugose; median carina sharply compressed, translucent, arcuate forward before the shoulders, longitudinally flattened over the middle area, and convex declivent toward the pronotal apex; dorsal front margin of pronotum truncate; lateral carinae conspicuous, the humeral angles very obtuse angulate; hind process stout, abbreviated, scarcely reaching to the knees of the hind femora; the lateral margins gradually convergent backward to near the apex, where they more abruptly converge to form an acute angle with an obtuse subtruncate apex, not at all emarginate; the anterior prozonal carinae behind the front border little elevated and parallel; sides of pronotal process with a broad somewhat undulate scapular area, widest above the articulation of the hind femora, narrowing backward to the apex; lateral lobes of pronotum posteriorly bearing only one large inferior sinus, deeply angularly excavate; the superior or tegminal sinus rudimentary, represented by a slight excavation nearly the length of the tegmina, and with a very indistinct notching forward; posterior angles of the lateral lobes broadly rounded externally, the lateral inferior margins little dilated.

Tegmina visible but very minute, the part showing narrow, and nearly twice the length of one of the eyes, but lying partly covered in the recess of the vestigial sinus; wings rudimentary, only extending

beyond the tegmina about the length of the latter, but normally covered by the hind process.

Fore femoral margins above entire, below subundulate; middle femora little compressed, margins minutely crenulate, very indistinctly undulate above and below; hind femora robust, the superior marginal carina crenulate, terminating in a pregenital tooth but not sharp; and an inconspicuous genicular eminence; the outer pagina rugose granulate, bearing on the outer face above a series of large oblique granulate tubercles; first joint of the posterior tarsi very much longer than the second and third combined.

Length of body, 9 mm.; pronotum, 7 mm.; hind femora, 5 mm.

Habitat. Brownsville, Texas. (Townsend).

Type: ♀ Brownsville, Texas, in my collection.

Cavotettix apterus sp. nov. or race (Plate XX, figs. 2-2c).

♀.—Description of type. Resembling *Cavotettix proavus* Rehn & Hebard in the form of the vertex and wide frontal scutellum; size slightly smaller, apterous, the hind femora more elongate; body above granulate, slightly rugose, sparingly sprinkled with coarser granulations.

Pronotum having the dorsum compressed, angulate produced forward over the head to the middle of the eyes; the median carina of dorsum cristate, quite highly arcuate longitudinally, highest between the shoulders, and bearing small translucent punctulations when viewed against the light, such as occurs in *Nomotettix compressus* Morse; the dorsal prozonal carinae behind the anterior border nearly parallel, yet subconvergent backward; surface between the shoulders granulate, with no indications of elevated ridges as in *proavus;* lateral lobes of the pronotum with but one inferior sinus, the usual superior tegminal sinus entirely obliterated, and completely obsolete (in *proavus* represented by a notch, in *nullisinus* by a slightly wider shallow excavation); the scapular areas between the lateral carina and inferior margin at the sides of the pronotum substraight, very broad forward, wider than in *nullisinus,* the inferior margin near the sinus dilated opposite the articulation of the hind femora, from this point backward the margins of the scapular area gradually contracted to near the apex of pronotum; the blunt apex of the latter reaching backward beyond the middle of the hind knees nearly to their apices.

Tegmina and wings absent, or entirely hidden from view; a very minute vestigial tegmen, almost hidden, appears on one side only in the male allotype.

Hind femora much less robust and more elongate than in *proavus,* the greatest diameter forward contained over two and one-half times in the length; first joint of hind tarsi nearly twice the length of the second and third combined.

Length of the body, 9.5 mm.; pronotum, 8.5 mm.; hind femora, 5.5 mm.

♂.—A male paratype measures: body, 8.5 mm.; pronotum, 7.5 mm.; hind femora, 5 mm.

This form may be only a race or variety, of *proavus,* yet the several characters which differentiate it warrants its description as a distinct species.

Habitat, Clarksville, Tennessee (Blatchley).

Type ♀ and *allotype* ♂, Clarksville, Tennessee, in the collection of W. S. Blatchley.

Differential Synopsis of the Species of Cavotettix.

1 (2) Crest of pronotum moderately low; dorsal front margin truncate or nearly so, partly covering occiput, but not reaching to the middle of the eyes; minute tegmina of female much longer than one of the eyes; median carina of vertex strongly compressed and prominent; median carina of pronotum thinly cristate, arcuate and translucent forward, longitudinally lower over the middle area, *Cavotettix nullisinus* sp. nov.

2 (1) Crest of pronotum rather high; dorsal front margin obtuse angulate reaching over the head to the middle of the eyes.

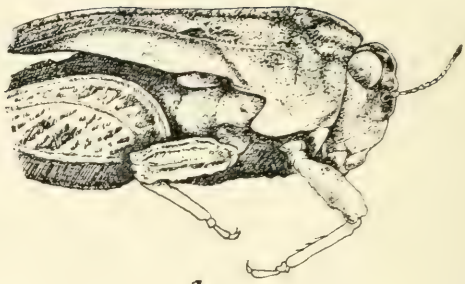
3 (4) Hind femora distinctly elongate; superior tegminal sinus of the lateral lobes obliterated; tegmina absent in female (or when present in male very minute, vestigial); wings absent; scapular area at the sides of the pronotum substraight, very broad and slightly dilated forward.....*Cavotettix apterus* sp. nov. or race.

4 (3) Hind femora moderately robust; superior tegminal sinus represented by a notch; tegmina of female about as long as one of the eyes; absent in the male; scapular area not dilated forward, *Cavotettix proavus* Rehn & Hebard.

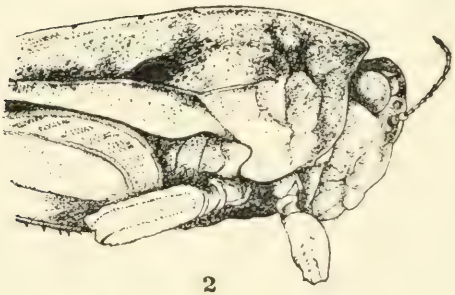
The Status of Nomotettix borealis Walker.

Some years ago when E. M. Walker[1] described the species *Nomotettix borealis,* I was led to believe that this species was the same as *Nomotettix sinufrons* Hancock, described ten years before.[2] After a recent reference to this species by Rehn and Hebard[3] where a synopsis of *borealis* is again given after a study of the type, I am more than ever satisfied that *borealis* and *sinufrons* are identical. The type of *sinufrons* in my collection is from St. Anthony Park, Minnesota, while Walker's type came from the Temagami District, Ontario.

1a



1



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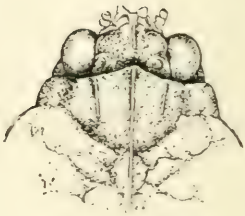
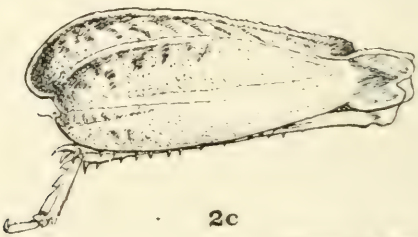


2a

2b



2c

J.L. Hancock Del.

NEW TETTIGIDS.—HANCOCK.

1—1A, CAVOTETTIX NULLISINUS; 2—2C, C. APTERUS.

According to my conclusion, without having seen the type, the name *borealis* falls as a synonym.[4]

EXPLANATION OF PLATE XX.

Fig. 1. *Cavotettix nullisinus* sp. nov. ♀. Profile view; drawn from type in the author's collection.
Fig. 1*a*. Same, dorsal aspect, head and fore part of pronotum.
Fig. 2. *Cavotettix apterus* sp. nov. ♀. Profile view; drawn from type in the collection of W. S. Blatchley.
Fig. 2*a*. Same, dorsal aspect of head and fore part of pronotum.
Fig. 2*b*. Same, face.
Fig. 2*c*. Same, hind leg.

On a Long-Winged or Caudate Phase of Neotettix proavus Rehn and Hebard (Orth.).

By HENRY FOX, Entomological Assistant, U. S. Bureau of Entomology.*

In 1916 Rehn and Hebard described *Neotettix proavus* on the basis of five specimens from the southeastern United States.† It is very evident from the remarks of these authors that they had to do solely with material in which the tegmina and wings were greatly reduced and with the caudal prolongation of the pronotum not exceeding the tip of the abdomen. During the early summer of 1917 the present writer found this species not uncommon locally in wooded areas in the vicinity of Clarksville, Montgomery County, Tennessee. Most of the specimens collected at this locality, and now in the collection of the writer and of the local field station of the Bureau, agree with the form described by Rehn and He-

[4] Can. Ent., XLI, p. 173, 1909.
[4] Ent. News, p. 278, 1899.
[3] Proc. Acad. Nat. Sc., p. 127, 1916.
[4] No answer was received from Dr. Walker to a letter asking for the loan of his type for examination. Very recently Blatchley received from Walker one of his two specimens of *N. borealis*, and finds, as I have above noted, that it is the same as my *sinufrons*.

* Published by permission of the Chief of the Bureau of Entomology.
† Proc. Acad. Nat. Sci., Phila., LXVIII, pp. 137-141.

bard, but there are two specimens in the lot which are interesting as representing a long-winged or caudate phase of this species.

Both of these specimens are females. One is shown herewith in the accompanying figure. With this should be compared the view of a typical, short-winged individual as shown in Figure 1, plate XII, of Rehn and Hebard's paper already cited. It will be observed that, in marked contrast to the latter, the form figured here has the tegmina quite well developed and external in position, whereas in the typical form they are greatly reduced and concealed from view beneath the pronotum. Correlated with the presence of well-developed tegmina is the presence

Neotettix proavus R. and H., long-winged phase.

of a clearly defined superior sinus on the caudal margin of the lateral lobe of the pronotum. This margin is therefore clearly bisinuate in the long-winged phase. In the typical phase the superior sinus is so inconspicuous that Rehn and Hebard have ventured to describe this margin as unisinuate. Other differences between the two phases—such as those in the degree of development of the wings and in the caudal extension of the pronotum—are evident from a glance at the figures.

It is obvious that the discovery of this long-winged phase of *Neotettix proavus* necessitates some modification in the statement of the differential characters of the species as given by Rehn and Hebard in their key to the species of this genus (op. *cited*, p. 138). Thus, as already intimated, the assertion therein that the lateral lobes of the pronotum have the caudal margin unisinuate applies strictly only to the typical form;

in the long-winged form this margin is clearly bisinuate, as in most Tettiginae. The further assertion in the key that the tegmina in the female are hidden under the pronotum is also true only of the typical form of the species. The last differential character mentioned in the key, namely, the strongly arcuate and sublamellate form of the pronotal median carina applies to both the typical and the long-winged form. To the mind of the present writer the most reliable and convenient character for separating *Neotettix proavus* from other members of the same genus is the form of the frontal costa, which appears to be quite constant in all the specimens examined and has been fully and clearly described by the authors named.

The Alleged Occurrence of a Seasonal Dimorphism in the Females of Certain Species of Mealy Bugs (Hemiptera; Coccidae).

By G. F. Ferris, Stanford University, California.

It has been asserted by various authors that the females of certain species of *Phenacoccus* and *Pseudococcus* are seasonally dimorphic. It is said that in these species the winter female is viviparous and possesses a smaller number of antennal segments than does the summer female, which is oviparous. As far as I am aware, these claims have not been questioned by any one and Brain[1] has even been led into a generalization to the effect that "I am inclined to associate the smaller number of antennal segments in these cases with retarded metabolism, as this is always found in the winter forms."

It is the purpose in this paper to show that in certain of these cases this alleged dimorphism does not exist. Furthermore, it is the intention to question that it ever exists in this group, at least as far as any morphological features are concerned.

We may first consider the case of *Pseudococcus agrifoliae* Essig, in which the evidence is sufficiently complete to leave

[1]Brain, C. K. The Coccidae of South Africa. *In* Trans. Royal Soc. S. Africa, vol. 1, pt. 2. (1915).

no room for reasonable doubt. Through the kindness of Mr. Essig I have been permitted to examine the types of this species. There are certain details in connection with these types that may be passed over, and it will suffice for my purpose to state that the material examined contains specimens of three species belonging to as many different genera.

Of these three species, one is nothing more than that previously described by Ehrhorn as *Ripersia villosa*. Another is a *Pseudococcus* that I am elsewhere describing as *P. quercicolus*. The third is represented only by immature specimens, but is unmistakably a species of *Puto* (=*Ceroputo*). The first is the "winter form," the second is the "summer form" of *P. agrifoliae*. The only reason that appears for regarding these as forms of the same species is the fact that they were found upon the same host. However, the two are morphologically so very different as to render it most highly improbable that they have anything to do with each other. Furthermore, the evidence obtained from observations on the life history of one of the species is sufficient to remove any doubt that might remain.

P. quercicolus, the "summer form" of *P. agrifoliae,* is quite common on oaks in the vicinity of Stanford University, and I have followed the species closely enough to be sure that it has but one generation per year. The winter is passed in the first or second larval stage, and maturity is reached in May or June. In one instance I have found mature females in February, but the conditions here were unique. The specimens were found beneath the bark in old and nearly overgrown borer workings in company with ants. No difference appears between these individuals and those taken in the summer.

Essig further states[2] that "It is very probable that the same dimorphic forms exist in *Pseudococcus artemisiae*." The reasons for this assumption are not given. I have examined the types of this species, also, and find that it is identical with *Erium lichtensioides* (Ckll.), a species that I know to have

[2]Essig, E. O. Pomona Col. Jn. Ent. & Zool., vol. 2, p. 148. (1910).

but one generation per year, at least in the vicinity of Stanford University. There is upon the same host a species of *Pseudococcus* (at present undetermined), and I suspect that this is the reason for Essig's statement. However, there is no more reason to assume that this is a form of *E. lichtensioides* than to assume that the latter is a form of *Phenacoccus artemisiae*.

King has recorded an apparent case of such seasonal dimorphism in connection with his original description of *Phenacoccus acericola*. He states that specimens of this species taken in the summer had nine-segmented antennae, while specimens taken in the autumn had eight-segmented antennae. It happens that a species of *Pseudococcus*, that I identify as *P. comstocki* (Kuwana), occurs on maple in the eastern states, and there is every possibility that confusion has resulted from this.

The last case that I shall consider (chronologically it is the first) is that of *Pseudococcus trifolii* (Forbes). This was described from a form with seven-segmented antennae. Later authors have regarded a form with eight-segmented antennae as the "summer form" of this species. The whole matter has been summed up by Forbes[3], and consequently I need not review the literature here. Through the kindness of Prof. Forbes I have had the privilege of examining one of the original co-types of this species and am, therefore, in a position to form some conclusions in regard to the matter.

The species described by Forbes proves to have six or seven segments in the antennae and to have but one pair of cerarii. These cerarii are on the anal lobes, and each contains two conical spines and two or three small setae which are surrounded by many scattered pores. The descriptions of the "summer form" are all insufficient to permit the definite recognition of the species, but there are certain points of value in which all agree and which may be summed up somewhat as follows: "A species with from fifteen to seventeen pairs of waxy tassels; with a crowded group of pores about the anal

[3]Forbes, S. A. Rept. State Ent. Ill., vol. 25, pp. 117-123. (1909).

lobe cerarii, adult female with 8-segmented antennae." In other words, it is a species with 15-17 pairs of cerarii (for that is what the tassels mean); a perfectly typical species of *Pseudococcus.*

The only evidence that I have been able to find in the literature tending to indicate that these may be forms of the same species is the fact that they occur upon the same host, and this I cannot consider to carry any weight whatsoever. A careful perusal of the paper by G. C. Davis[4], who appears to have been responsible for the original assumption that these are forms of the same species, indicates that he did not have the species described by Forbes. Neither is there any evidence that any one has actually reared the one form from the other in a carefully controlled experiment. It does appear that the species examined by Davis was oviparous at one season of the year and viviparous at another, but this is not, after all, a very great difference. However, it does not appear that Davis' experiment was sufficiently well controlled to demonstrate even this beyond question.

The morphological evidence alone is sufficient to indicate that here again two entirely distinct species have been confused. As I have already noted, the description of this "summer form" is insufficient to permit the definite determination of the species, but it is possible that this is nothing more than *Pseudococcus maritimus* (Ehrh.). This is a species that was originally described from California, where it is found upon an extremely wide range of hosts, but which occurs throughout the United States. I have seen specimens from wild cherry in New York, from osage orange and sycamore in Ohio and from clover in Oregon, as well as from numerous hosts in California. It is practically certain that this is the species described by Hollinger as *P. omniverae* from numerous hosts in Missouri. The various descriptions of *P. trifolii* all agree in speaking of the mass of pores about the anal cerarii, and this is a very characteristic feature of *P. maritimus.* If my surmise be correct, there remains no doubt that this is not a dimorph of the original *trifolii,* for its life history is well enough known, and it has never been suspected of any irregularities.

It is to be hoped that the matter may soon be so effectually cleared up that no possible doubt may remain. The difficulties in the way of studying the mealy bugs are sufficient without the interpolation of any that are wholly imaginary.

[4]Davis, G. C. Michigan Ag. Exp. Station, Bull. 116, pp. 58-60. (1894).

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., NOVEMBER, 1918.

Entomology in Central Europe.

Recent military and political events in Europe raise one's hopes that the end of man's violent attack on the life of his own species is approaching and that among the blessings of peace may be a renewed cultivation of the constructive sciences. How thoroughly depressed entomology and, doubtless, other fields of study appear to those in Central Europe may be seen from the following extracts from letters from a correspondent in a neutral country, written the past summer.

I have fallen into a kind of apathy regarding almost everything in connection with my foreign correspondents. This is part of a general mental disposition, prevailing in myself (and in many others!); one tries to do his daily work, to look for some distraction and comfort in direct contact with Nature (who is not changed) and leave the rest to kismet. May this unhappy condition change before it becomes unchangeable or worse!

I think I am not mistaken if I note the progressive atrophy of scientific work, here and elsewhere, as far as I can see; no doubt it would be superficial to see the reason for this phenomenon in want of paper, increased expense for printing, want of working hands; all these things have their share, but the principal reason is the condition of minds.

You may scarcely imagine how much the condition of all our scientific periodicals—I believe not only here but all over Europe—is discouraging [to] writing any article of some length. They can neither live nor die, but I am afraid the prognostic is rather for death. The leading medical papers alone seem to make exception, the one I am subscribing [to] for more than thirty years remains on a remarkably high standard and is even positively improved by the reduction of space. Epidemiology appears to be the branch of science that has taken most profit from the common disaster of all; also a *signum temporis*.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Collecting Notes from California (Lepid.).

Dr. Holland and Prof. Comstock both insist that all Heterocera rest with wings spread flat, or rolled—never held erect in butterfly fashion. Out here we have several small Geometers (*Hydriomena?*) that often rest in true butterfly style, with wings erect, but they also frequently rest with outspread wings. But has anyone ever seen *Fernaldella fimetaria* G. & R., resting with wings flattened out? I have taken dozens at light here in the past three years, and seen hundreds of specimens, and have yet to see one resting in moth-fashion. The wings are always held erect and tightly together.

Possibly because of the evenly distributed rains of that year, this country swarmed with entomological prizes in the spring of 1915. The following usually uncommon moths were all abundant at light: *Fernaldella fimetaria* G. & R., *Syneda howlandi* Grote, *Triocnemis saporis* Grote, *Trochoclea antica* Smith, *Fishea yosemitae* Grote, *Copicucullia propinqua* Smith.

In 1916 and 1917 I failed to take a single specimen of any of the above named, although collecting at the same locality, and all other sorts were comparatively scarce. This year there again appears to be an abundance of insect life.

This spring I captured a *Papilio rutulus* minus both tails. These had not been broken off, but the hind wings were apparently deformed, being fluted and crimped at the anal angle, with a yellow half-moon where the tail should have been.—W. H. IRELAND, Maricopa, California.

Key to Eastern Species of Rhyphus (Dip.).

As there is no key giving the differential characters of the three species of *Rhyphus* occurring in the northeastern states, I submit the following. It is based on the study of a rather large series of specimens.

a. Basal section of *M2* as long as, or longer than, the median cross-vein; i. e., the bases of the three veins arising from the apex of the discal cell about equidistant from each other.

b. Wing with a distinct yellowish spot near the middle of the costal margin; subapical hyaline spots sharply defined; eyes of male holoptic; median dorsal vitta geminate; i. e., divided by a slender gray line, more distinct in the female ..... *alternatus* Say.

bb. Yellow and hyaline spots less distinct and more diffuse; eyes of both sexes dichoptic; median dorsal vitta only indistinctly, if at all, geminate ..... *fenestralis* Scopoli

aa. Basal section of *M2* much shorter than the median cross-vein; eyes of male holoptic; no yellow spot near middle of costal margin.

punctatus Fabr.

—W. J. BAERG, Ithaca, New York.

Notes on Papilio indra Reakirt (Lep.).

According to most accounts, *Papilio indra* occurs only at high elevations, around 10,000 feet. However, at the confluence of the Okanogan and Columbia rivers, in Washington, at an altitude of only 580 feet, I have taken 40 in one day, nearly all of them torn, owing to the strong north wind and their habit of flying among the hard sage brush and grease-wood. They are water-loving and seem to take to water immediately after transforming, as the only perfect ones were secured at the edges of puddles. They are strong fliers, and when aroused are gone for good. The food-plant of *indra* is supposed to be *Artemisia dracunculoides*. I believe, however, that in the locality mentioned, they feed on an umbelliferous plant, a wild parsley, which grows on

high, dry, sandy hillsides and dies down by the end of May. *P. indra* occurs and disappears simultaneously with it. I have noticed this during five seasons of collecting. During a light shower I took 2 ♀ on it, notwithstanding large sage brush being all around to hide in. *P. zolicaon* feeds on the same plant. The larva of *zolicaon* is orange and black, and I have found larvae almost entirely black, which I took to be *P. indra*. I had them pupate, but a small Ichneumon, about 2 mm. long, attacked the pupae and destroyed them, along with pupae of *rutulus, daunus, brucei, eurymedon* and *zolicaon*, all of which are found there. The pupae are nearly black, while that of *zolicaon* is a light brown.

On July 20, 1916, I took one *P. indra* on Foggy Dew Creek, Okanogan County, Washington, at an elevation of about 2,000 feet, also at the same place a *Parnassius* and several *Oeneis gigas*. The male *indra* seems to prefer the tops of the foothills, where it is found in company with *brucei* and *zolicaon*, while what females I took were found at the water edge and low canyons. It is characteristic that *indra* when aroused always flies uphill. All my *indra* were taken from April 20 to May 25, by which time only old specimens are found. *P. brucei* in the same place raises 2-3 broods a season, but its food plant grows on irrigation ditches and is green all summer. The larva of *brucei* will eat the wild parsley, but *zolicaon* and what I believe to be *indra* will not eat the food plant of *brucei*, but starve instead.

In the same region I took a hybrid of *B. lorquini* and *B. disippus*, which is in the collection of the American Entomological Society.—J. C. Hopfinger, Bay City, Texas.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico is given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

2—Transactions, American Entomological Society, Philadelphia. **4**—The Canadian Entomologist, London, Canada. **6**—Journal, New York Entomological Society. **9**—The Entomologist, London. **10**—

Nature, London. **50**—Proceedings, U. S. National Museum, Washington, D. C. **68**—Science, Lancaster, Pa. **87**—Bulletin, Societe Entomologique de France, Paris. **102**—Proceedings, Entomological Society of Washington. **143**—Ohio Journal of Science, Columbus, Ohio. **153**—Bulletin, The American Museum of Natural History, New York. **238**—Anales, Sociedad Cientifica Argentina, Buenos Aires. **272**—Memorias, Real Academia de Ciencias y Artes de Barcelona. **273**—Proceedings, Royal Society of Edinburgh. **285**—Nature Study Review, Ithaca, N. Y. **322**—Journal of Morphology, Philadelphia. **411**—Bulletin, The Brooklyn Entomological Society, Brooklyn, N. Y. **438**—Bulletin, Illinois State Laboratory of Natural History, Urbana. **447**—Journal of Agricultural Research, Washington, D. C. **490**—The Journal of Parasitology, Urbana, Illinois. **540**—The Lepidopterist, Salem, Mass. **548**—Physis, Revista de la Sociedad Argentina de Ciencias Naturales. **556**—Zoological Society Bulletin, New York.

GENERAL SUBJECT. **Beebe, W.**—Insect tyrants. **556,** xxi, 1670-73. **Blackmore, E. H.**—Rare and uncommon insects taken in British Columbia during 1917 (Rept. Provincial Mus. Nat. Hist., Br. Columbia, 1917, pp. 11-13). **Crampton, G. C.**—Probable ancestors of insects and myriapods. **4,** 1918, 285-8. **Glaser, R. W.**—The polyhedral virus of insects with a theoretical consideration of filterable viruses generally. **68,** xlviii, 301-2. **Harrington, W. H.**—Entomological collections of. **4,** 1918, 292. **Walsingham, Lord**—German naturalists and nomenclature. **10,** cii, 4.

ARACHNIDA, ETC. **Barrows, W. M.**—A list of Ohio spiders. **143,** xviii, 297-318. **Dunn, L. H.**—The tick as a possible agent in the collocation of the eggs of Dermatobia hominis. **490,** iv, 154-8. **Simon, E.**—Notes sur la synonymie de plusieurs araignees de la famille des Clubionidae. **87,** 1918, 201-2.

NEUROPTERA, ETC. **Longinos Navas, R. P.**—Algunos insectos neuropteros de la Argentina. **548,** iv, 80-89. **Rich, S. G.**—The gill-chamber of dragonfly nymphs. **322,** xxxi, 317-49.

Folsom, J. W.—A new Isotoma of the snow fauna. **4,** 1918, 291-2. **Kennedy, C. H.**—New sps. [5] of Odonata from the southwestern U. S. **4,** 1918, 256-61; 297-300. **Longinos Navas, R. P.**—Neuropteros nuevos o poco conocidos [1 new]. **272,** xiv, 339-66.

ORTHOPTERA. **Davis, W. T.**—Introduction of palaearctic preying mantids into the north Atlantic states. **411,** xiii, 73-6. **Howard, L. O.**—Schistocerca tartarica taken at sea. **102,** xix, 77. **Lynch Arribalzaga, E.**—La langosta voladora de Columbia y Venezuela. **548,** iv, 49. **McAtee & Caudell**—First list of the Dermaptera

and Orthoptera of Plummers Island, Maryland, and vicinity. **102,** xix, 100-22.

Rehn & Hebard—Study of the N. A. Eumastacinae (Acrididae) [2 n. sps.]. **2,** xliv, 223-50.

HEMIPTERA. Baker, A. C.—Our birch Symydobius distinct from the European (Aphididae). **4,** 1918, 318-20. **Drake, C. J.**—The N. A. species of Teleonemia occurring north of Mexico [3 new]. **143,** xviii, 323-32. Notes on N. Am. Tingidae [2 new]. **411,** xiii, 86-8. **Lizer, C.**—Psylla erythrinae n. sp. (S. A.). **238,** lxxxv, 307-10. **Stevens, H. M.**—Contribution to the knowledge of the family Chermesidae. I.—Biology of the Chermes of spruce and larch and their relation to forestry. **273,** xxxvii, 356-81.

Barber, H. G.—Concerning Lygaeidae.—No. 2. [12 new]. **6,** xxvi, 49-66. **Knight, H. H.**—Genus Sericophanes with descriptions of two n. sps. (Miridae). **411,** xiii, 80-3. (See **Drake** above.)

LEPIDOPTTRA. Ainslie, G. G.—Color variation in pupae of Terias nicippe. **102,** xix, 78. **Bonniwell, J. G.**—Notes on collecting in Florida. **540,** ii, 57-60. **Blackmore, E. H.**—New British Columbia L. (Rept. Prov. Mus. Nat. Hist., Br. Columbia, for 1917, pp. 14-15). **Davis, W. T.**—A moth, Anacampsis innocuella, at Cold Spring, Long Island, N. Y. **6,** xxvi, 111-12. **Marlatt, C. L.**—The origin of the pink boll worm. **68,** xlviii, 309-12. **Mayor, C. M.**—Sugaring. **9,** 1918, 188-90. **Young, B. P.**—Ecological notes on the spring canker worm (Paleacrita vernata). **4,** 1918, 267-80. **Zesch, A.**—Studying butterflies. **285,** xiv, 242-8.

Beutenmuller, W.—Descriptions of new Catocalae [6 new]. **540,** ii, 60-3 (cont.). **Ely, C. R.**—Revision of the N. A. Gracilariidae from the standpoint of venation [3 n. gen.]. **102,** xix, 29-77. **Heinrich, C.**—A new Coleophora injurious to apple in California. A note on the tortricid genitalia. **102,** xix, 135-6; 137-8. **Swett, L. W.**—Geometrid notes—Hydriomena [1 new]. **4,** 1918, 293-6.

DIPTERA. Brethes, J.—Description d'une nouvelle "Dexiinae" argentine. **548,** iv, 115. **Greene, C. T.**—Contribution to the biology of N. A. Diptera. **102,** xix, 146-61. **Malloch, J. R.**—Partial key to the genus Agromyza—IV. **4,** 1918, 315-18. **Snyder, T. E.**—A peculiar habit of a horsefly (Tabanus americanus) in the Florida everglades. **102,** xix, 141-6.

Aldrich, J. M.—Two new Hydrotaeas (Anthomyiidae). **4,** 1918, 311-14. **Hine, J. S.**—Descriptions of seven species of Asilus. **143,** xviii, 319-322. **Malloch, J. R.**—A new No. Am. species of Antho-

myiidae. **4,** 1918, 310. An undescribed N. Am. species of Hydrotaea (Anthomyiidae). **411,** xiii, 93-4. **Smith, H. E.**—Notes on N. A. Tachnidae, including the description of one new genus. **102,** xix, 122-6. **Sturtevant, A. H.**—Synopsis of the nearctic species of the genus Drosophila [1 new sp.]. **153,** xxxviii, 441-46. **Walton, W. R.**—Three new tachinid parasites of Eleodes. **102,** xix, 22-5.

COLEOPTERA. Barber, H. S.—Notes and descriptions of some orchid weevils. **102,** xix, 12-22. **Beutenmuller, W.**—Notes on the Cychrus found in the Black Mts., No. Carolina. **411,** xiii, 89-90. **Fisher, W. S.**—A new sp. of longicorn beetle infesting cowpeas from Mexico. **102,** xix, 173-4. **Frers, A. G.**—Metamorfosis de Trogoderma pectinicornis (Dermestidae). **548,** iv, 90-4. **Greene, G. M.**—A rare Coleoptera paper of T. W. Harris. **2,** xliv, 251-61. **d'Orchymont, A.**—Note preliminaire sur la nervation alaire des C. **87,** 1918, 170-2. **Robertson, C.**—Bees and Strepsiptera. **411,** xiii, 83-5. **Woodruff, L. B.**—Note on Cremastochilus. **6,** xxvi, 110-11.

Hyslop, J. A.—A new genus (Perissarthron) of Elateridae, and a revision of the American Elateridae of the genus Pyrophorus, with descriptions of [3] n. sps. Elaterid genus Oistus of Candeze [1 new]. **102,** xix, 1-12; 126-8. **Pierce, W. D.**—The comparative morphology of the order Strepsiptera together with records and descriptions of insects. **50,** liv, 391-501. **Nicolay & Weiss**—A review of the genus Buprestis in No. America [2 new]. **6,** xxvi, 75-109. **Schwarz & Barber**—Two new hydrophilid beetles. **102,** xix, 129-35.

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1918, 301-4. **Thompson, C. B.**—Dual queens in a colony of honey bees. **68,** xlviii, 294-5.

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Doings of Societies.

Entomological Section of The Academy of Natural Sciences of Philadelphia.

Meeting of May 23, 1918. Director Philip Laurent presiding, twelve persons present.

Lepidoptera.– Dr. P. W. Whiting, of the University of Pennsylvania, made an interesting communication on his genetic researches with the common flour or grain moth, *Ephestia kuhniella*. He found that there was quite an extension in the hatching of a single laying over a period varying from two to three months. The moth in its different stages is very susceptible to temperature and humidity, the best results in the rearing being obtained in a high temperature and humidity ranging near 90 per cent. There were three distinct types found in the course of breeding: a typical, nearly uniformly grayish brown form, a "black-shouldered" form having black areas at the bases and apices of the primaries, and an entirely black form. The degree of development of the adult mouth parts varied considerably, in some cases being almost wanting. There were also some noticeable malformations in the genitalia, and a few cases of intersexes were noticed. The ravages of a coccidian, a protozoan parasite, which proved very destructive among the larvae, wiping out whole colonies, necessitated thorough sterilization of the apparatus and media. Another parasite of the larva was a hymenopteron, a species of *Habrobracon*, and the study of its life history and variations gave some very interesting results. The communication was illustrated by drawings and series of the bred moth material.

Diptera.– Mr. Hornig exhibited specimens of *Aedes squamiger* Coq. as a new record for Philadelphia. He stated that two to three days elapse between emergence and the first feeding. He also mentioned finding some eggs of *A. triseratus* in moist dirt, not water, from a crotch of a tree, a medium in which he could not imagine the larvae could live.—E. T. Cresson, Jr., *Recorder.*

Feldman Collecting Social.

Meeting of June 19, 1918, at the home of H. W. Wenzel, 5614 Stewart Street, Philadelphia; all the members (thirteen) present. President H. W. Wenzel in the chair.

Lepidoptera.— Mr. Huntington said he had been troubled by many clothes moths in his bedroom and was at a loss to find where they bred as he had examined all the clothes in wardrobe and chiffonier, but finally discovered they were breeding in the felt in the heels of his shoes, having completely eaten the pads from several pairs of shoes. Mr. Haimbach recorded a single specimen of *Nacophora quernaria* S. and A., which he collected on his place at Lower Merion Township, Montgomery County, Pennsylvania, VI-3-18.

Coleoptera.—Mr. Laurent exhibited a series of *Neoclytus erythrocephalus* Fabr. as well as a section from the trunk of a nine-inch persimmon tree showing the borings made by the larvae of this beetle. From a twelve-inch log cut from the trunk of the tree eighty-one specimens emerged from May 10th to June 3rd. The greatest number to appear in one day was on May 21st, when eighteen beetles emerged. Previously he had bred this species from a three and one-half-inch limb of an English walnut, where they had bored through the entire limb, but in this case only the sap wood was attacked. Mr. H. W. Wenzel said insect life about here seems to be scarce this year, specially good material, and that he is specializing in Elateridae this season, having so far turned up twelve species of *Melanotus*. Recorded the following Coleoptera collected by H. A. Wenzel and himself: Castle Rock, Pennsylvania, V-19: *Ludius* (*Corymbites*) *tarsalis* Melsh. on willow and young walnut, *L.* (*C.*) *hamatus* Say on hickory, *Elater luctuosus* LeC. on willow, their first record, and *Leptura mutabilis* Newm. on hickory, also their first record; Somers Point, New Jersey, V-26: *Dicaelus purpuratus* Bon., *Typophorus 6-notatus* Say on cedar, also several species of *Elateridae;* Broomall, Delaware County, Pennsylvania, VI-2: six species of *Melanotus, Nothodes dubitans* LeC., their first record, and *Saperda puncticollis* Say; Millville, New Jersey, VI-8: *Aneflomorpha* (*Elaphidion*) *aculeatum* LeC., *Helops cisteloides* Germ. (their record for this latter species last year was VII-15), *Cinyra gracilipes* Melsh. on oak and *Goes debilis* LeC.; Ardmore Junction, Pennsylvania, VI-16, on elder blooms: four species of *Leptura, lineola* Say, *vittata* Swed., *vagans* Oliv. and *rubrica* Say.—Geo. M. Greene, *Secretary.*

OBITUARY.

Dr. Gustavo Leonardi, the well known coccidologist, died the 25th of August, 1918, in Ventimiglia, Italy, aged 49 years.—F. Silvestri.

EXCHANGES.

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Lepidoptera—I have for exchange first class specimens of *Papilio floridensis, palamedes, Pholus fasciatus, tersa, hylaes, undulosa, Apatela tritona, Leucania pilipalpis, extincta, subpunctata, Gortyna x-album, Syneda graphica,* and hundreds of others from Pa. and Fla Send lists, or address F. W. Friday, 82 Jacob St., Fair Haven, Pittsburgh, Pa.

Catocalae—For exchange perfect specimens of *C. pura, C. aspasia* and var. *sara, C. faustina* var. *lydia, C. praeclara.* Desire other *Catocalae.* Some of the common species wanted.—John H. West, 2057 E. York St., Phila., Pa.

Wanted in series for cash or exchange beetles of the genus *Serica* (Scarabaeidae) from all parts of North America. *Cicindela lincolniana* Casey among the exchanges offered. R. W. Dawson, Department of Entomology, University Farm, Lincoln, Nebraska.

Prof. Dr. Carlos E. Porter, Directeur des "Anales de Zoologia Aplicada," Casilla 2974, Santiago, Chile, is anxious to secure systematic papers on entomology, especially on the Thysanoptera, Coccidae, Aleyrodidae, Acarina, Chalcididae, Agromyzidae, Syrphidae and Longicornia. He will be glad to exchange specimens and publications.

Change of Address.—E. G. Titus from Logan, Utah, to Box 453, Idaho Falls, Idaho.

Wanted for Cash—Lowest insects of all families, preserved in fluid, for phylogenetic study. G. C. Crampton, Amherst, Mass.

Wanted—South American and Indian macrolepidoptera in exchange for Australian specimens in any order. (Rev.) H. S. Bodley, The Vicarage, Birchip, Victoria, Australia.

Wanted—A series of volumes of the Candian Entomologist including vols. 29, 30 and 31; also Ontario Entomological Society Reports, Nos. 2, 3, 4, 8 and 9. State condition and price wanted. M. H. Ruhmann, Vernon, British Columbia.

For Exchange—Have rare western Lepidoptera which I will exchange for butterflies, (North American preferred.) Send lists of your offerta.—Dr. John Comstock, 321 South Hill St., Los Angeles, Cal.

Wanted—Canadian Entomologist. Part xx of H. F. Wickham's Coleoptera of Canada or complete number of Can. Ent., xxix, Feb., 1897, containing same. Also Farmers' Bulletins 189 and 191. Geo. M. Greene, 2534 W. Columbia Ave., Philadelphia, Pa.

Catocalae—For exchange; perfect specimens of *Faustina* var. *zillah, similis, gracilis.* Desire other *Catocalae.*—Ernest Baylis, 5011 Saul Street, Phila., Pa.

Wanted to Exchange—I wish to exchange Rhopalocera from eastern United States for those of the western and southern part. Correspondence desired. Paul N. Musgrave, 130 Oak St., Clarksburg, W. Va.

Incisalia polios for Exchange—Want *I. irus, augustus, niphon, T. damon* and *Thecla* from South and West. Also have *L. pontiac* to exchange for "Skippers." H. M. Bower, 702 First National Bank Bldg., Milwaukee, Wis.

Wanted to Exchange—I wish to exchange Actias luna cocoons for Lepidoptera. Carl Selinger, 4419 Dover St., Chicago, Ill.

Will pay cash for Pars 39 and 52: Coleopterorum Catalogus, of Junk. Jos. O. Beaulne, 3653 Notre Dame East, Montreal, Canada.

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